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| Unit 4: Day 1: 2-D or 3-D? | | | | Grade 7 |
| 20-30-10 | | Math Learning Goals   * Distinguish between 2-D shapes and 3-D figures. * Estimate areas of triangles and quadrilaterals. * Consolidate the characteristics of perimeters and areas of triangles, rectangles, and parallelograms. | | Materials   * cm grid paper * sticky notes * geometric models * BLM 4.1.1, 4.1.2 |
| Assessment  Opportunities | | | | |
|  | Minds On… | Individual 🡪 Review  Show some 2-D shapes and 3-D figures and name them.  Students complete BLM 4.1.1. Clarify any concerns that students raise.  Pairs 🡪 Activate Prior Knowledge  Each pair selects one shape from the list (question 2, BLM 4.1.1). They sketch the shape(s) chosen and write one or two properties of the shape that are not included in its definition. Post the notes on a Know/Want to Know/Learn classroom chart. Read aloud and discuss the students’ responses of terms. |  | Have models of geometric objects prominently on display.  Word Wall   * 2-D shapes * 3-D figures * parallelogram * trapezoid * equilateral triangle * rhombus * rectangular prism * triangular prism |
|  |
|  | Action! | Pairs 🡪 Investigation  Students investigate perimeter and area of 2-D shapes (BLM 4.1.2).  Communicating/Observation/Rating Scale: Focus on fluent, accurate, and effective use of mathematical vocabulary. |
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|  | Consolidate Debrief | Whole Class 🡪 Discussion  Students explain how they estimated the areas of the various shapes. They could tell that they decomposed larger shapes into simple shapes such as right triangles. Others may explain how a right triangle is half of a rectangle.  Review area and perimeter formulas. Post these formulas.  Students demonstrate how they applied the area formulas. Encourage all possible answers and ask whether they think there is more than one method of solving these types of problems. Check answers using overhead transparency. |
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| Concept Practice  Reflection | | Home Activity or Further Classroom Consolidation   * In his description of the dinner, Gulliver confused some two-dimensional shapes with three-dimensional figures. Make a list of the two-dimensional shapes he named and another list of the three-dimensional figures. Then rewrite Gulliver’s first paragraph using the appropriate terms.   OR   * Use two-dimensional and three-dimensional shapes and figures to present Gulliver’s dinner. Label each shape and figure.   OR   * Write a sentence and draw a sketch to explain the meaning of each term. You may need to use a dictionary. * parallelogram * trapezoid * equilateral triangle * rhombus * rectangular prism * triangular prism   (Adapted from Impact Math – Measurement) |  |

4.1.1: 2-D or 3-D?

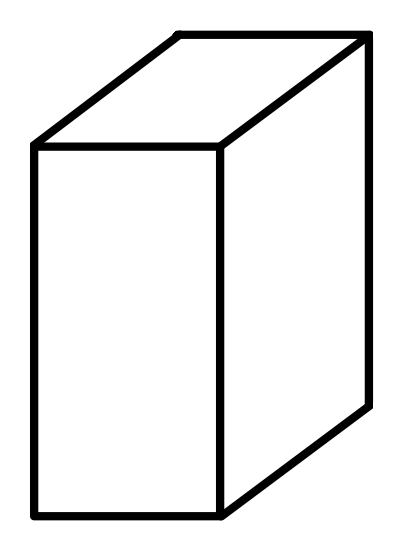
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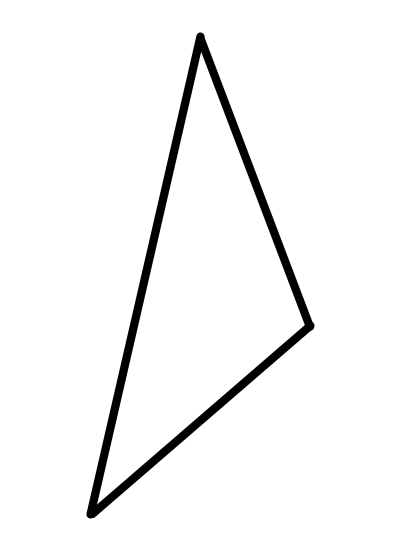
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Think about two-dimensional (2-D) shapes and three-dimensional (3-D) figures. A 2-D shape, such as a triangle, lies on a flat surface while a 3-D figure, such as a rectangular prism, projects above or below the surface.

1. Write names of the following geometric objects in the correct column of the table:   
rhombus, right triangle, cylinder, parallelogram, triangular prism, square, cone, polygon, rectangle, sphere, circle, quadrilateral, pyramid, scalene triangle

|  |  |
| --- | --- |
| Two-Dimensional Shapes | Three-Dimensional Figures |
|  |  |





Triangle   
(2-D)

Rectangular Prism (3-D)

2. Draw a line from each 2-D shape name to its definition. Some definitions could represent more than one shape so select the most appropriate definition in each case.

|  |  |
| --- | --- |
| Polygon | A quadrilateral with both pairs of opposite sides parallel |
| Triangle | A three-sided polygon |
| Quadrilateral | A rectangle with all four sides equal |
| Parallelogram | A 2-D closed shape whose sides are straight line segments |
| Rectangle | A quadrilateral with all four sides equal |
| Rhombus | A four-sided polygon |
| Square | A quadrilateral with four right angles and both pairs of opposite sides equal |

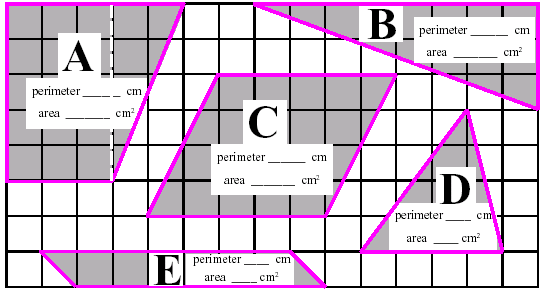
4.1.2: Gulliver Dines with the Mathematicians

(Source: Impact Math – Measurement)

*Gulliver's Travels* is a popular tale of a traveller named Gulliver who sailed the oceans to strange and distant lands. Most people know of his visit to Lilliput, the land of the little people. Some know of his visit to Brobdingnag, island of the giants. But few have read the chapter about Gulliver's visit to Laputa, the land of the mathematicians. Some small excerpts from that visit are presented here in a slightly modified form, to modernize the old English in which this manuscript was written almost three centuries ago!

“We had two courses of three dishes each. In the first course, there was a shoulder of mutton [lamb], cut into an equilateral triangle; a piece of beef into a rhombus and a pudding into a cycloid [cone] … The servants cut our bread into cones, cylinders, parallelograms and several other mathematical figures … Their ideas are perpetually expressed in lines and figures. To praise the beauty of an animal, they describe it in terms of rhombuses, circles, parallelograms, ellipses and other geometric terms.”

1. Name the 2-dimensional shapes drawn on the centimetre grid below. Count squares to estimate the perimeter and area of each. Record your estimates.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Shape | Name of Shape | Estimated Perimeter | Estimated Area | Calculated Area |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |
| D |  |  |  |  |
| E |  |  |  |  |

4.1.2: Gulliver Dines with the Mathematicians (continued)

2. Write as many of these area formulas as you know.

a) The area of a rectangle given its length *l* and width *w*.

b) The area of a triangle given its height *h* and the length *b* of its base*.*

c) The area of a parallelogram given the length *l* of one side and the perpendicular   
distance *d* from it to the other parallel side.

Use the formulas you know to check your estimates of the area of each shape in question 1. Reflect on how accurate your estimates were.

3. Draw each of these 2-dimensional shapes on cm grid paper.

a) a rectangle of area 20 cm2 and perimeter 18 cm.

b) a parallelogram of area 24 cm2 and perimeter 22 cm.

c) a quadrilateral of area 20 cm2 and perimeter 20 cm.